

00188US1.ST25.txt
SEQUENCE LISTING

<110> Benjamin, Christopher W.
Roberts, Steven L.
Karnovsky, Alla M.
Ruble, Cara L.

<120> Human Ion Channels

<130> 00188US1

<150> 60/215,815

<151> 2000-07-05

<150> 60/216,481

<151> 2000-07-06

<150> 60/216,479

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<150> 60/217,096

<151> 2000-07-10

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 <212> DNA
 <213> Homo sapiens

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 cagccacagc tcctccagaa agggacagcc acggccaagt ggttgctggt ctttgggcca 420
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<210> 9
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<212> DNA
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<210> 10
<211> 563
<212> DNA
<213> Homo sapiens

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tggaatatta agagttccaa aaagagaaca gaggaaaaga tgaggaagaa attaaggatg 180
aactaaccgt aagaaaattt gccaaaacag agaatgagtc ttcaatgcta aaagggtgac 240
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 <212> DNA
 <213> Homo sapiens

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<212> DNA
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<210> 16
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<212> DNA
<213> Homo sapiens

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aggc 664

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<211> 628
<212> DNA
<213> Homo sapiens

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<212> DNA
<213> Homo sapiens

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<210> 20
 <211> 534
 <212> DNA
 <213> Homo sapiens

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<210> 21
 <211> 439
 <212> DNA
 <213> Homo sapiens

<400> 21
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<210> 22
<211> 622
<212> DNA
<213> Homo sapiens

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<210> 23
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<212> DNA
<213> Homo sapiens

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<210> 24
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 <212> DNA
 <213> Homo sapiens

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<210> 25
 <211> 246
 <212> DNA
 <213> Homo sapiens

<400> 25
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 gtgccctgtg tgctcatctg gggcctgggt ctgcttgcc actttctgcc agcacagggt 180
 aagcagtggc ccctaacct ccccaaac ccgggctcgct cccgggaggc ggggcccgt 240
 ctact 246

<210> 26
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 <212> DNA
 <213> Homo sapiens

<400> 26
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 gcagccgagg ggacatggcg tgggtggtgg gcgtccgctg ggacacgttg agcacgatga 180
 cgcaattcat gacaatgagc gtggcgacca ccatgacgaa aataaggaac ctgaggagcc 240
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 cacaacacg gcttctctg gtacgggctg gttacgcct ccagctgcgc cccctacacg 360
 acgacagacg cgtcccccaa cccttctaac tgtacctacc acttgaggcg gccatgaagg 420
 ggacccccag ctccctgga 439

<210> 27
 <211> 597
 <212> DNA
 <213> Homo sapiens

<400> 27
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 aaacatgctt tgtgtgttt gctgatgtat tgagtaatag aatgtcagat ggaagcaagt 120

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atagaccagt attctcgaat tctcttccca gttgcatttg caggattcaa ccttgtgtac 540
tggggtagtt ttatctttcc aaagatacaa tgggaagtga gtaccagtgt tgaatag 597

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<210> 28
<211> 263
<212> DNA
<213> Homo sapiens

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<400> 28
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acgcccagc gaacacagcg cgggcgttaa tgtcaatggt gtctgcgtcc atgggcctga 180
gccggggcag gatgcccccc tggcctcctg agcgggctgc cccctccttc ttcgtctccc 240
ctgtctccac cccaccgac ctg 263

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<210> 29
<211> 401
<212> DNA
<213> Homo sapiens

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<400> 29
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ggctcttttac ctctctcgg actgtggtga aaaagtgcg ctttgtattt cagtcctgct 180
ttctctgact gtgtttttgc tggatcacac ataaaccatc ccatccacat ctctggtggg 240
ccactggtg ggtgagtacc tgctgttcac catgatcttt ggcacactgg ccatcgtggt 300
gactgtgttt gagttgaaca tacactaccg caccccaacc acgcacacaa tgcccagggtg 360
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<210> 30
<211> 213
<212> DNA
<213> Homo sapiens

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<400> 30
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catggccttc tctgtcttca ccatcatctg cac

213

<210> 31
 <211> 639
 <212> DNA
 <213> Homo sapiens

<400> 31
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 actcacataa aacatgatct ggtcatatag gttgttgccc atggacatct ttgggggtggc 180
 cttgttgatg cccaagagct cccactcccc ctgggtttgg atgactttgc gagacgtgtc 240
 tgtgatctcc cacacctcct tgtccatgcc cagcagcatg ctgtccactg gaagggaggc 300
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 cactgagctt ctaaaccaaa ttttctctta tccttttaaa gcagggtatc ctggttttct 420
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 tgagtcaaga acttttggag tcattcctat tttccttctc agtccccag tcgtatggtg 600
 gtgttttagt ggaatcaagc ttgaatagct caatatatt 639

<210> 32
 <211> 685
 <212> DNA
 <213> Homo sapiens

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 cagtcttcaa ctacacaata gcaatgtgtg tctccatata acttgtcttt tgatttgtct 180
 tgtcttttga tttgttcaat cattgcatgc ctctataata taaatattat attaccatgc 240
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 gctggaaccc aaacagaaat ccaagtcttt attcttcaa taccaccagt gcttttagagt 480
 ttggcacttg gcctctccta atcttgtaact taaatcctga catgtttatt ttgcatttta 540
 aaagccaacc gctttataaa atgctttgac ctactttttt gttttttata agcctccatt 600
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 aaataagata atacatgtca ggcat 685

<210> 33
 <211> 484
 <212> DNA
 <213> Homo sapiens

<400> 33
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 cttcctccct gtcactttct tctcctccc aactgcgaaa cagccttttc atttcttaaa 180
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 tttttaaaaa ttcaatgtgc atttccttag tgggtggtat cttttgtgc tcataaaatg 480
 tgat 484

<210> 34
 <211> 449
 <212> DNA
 <213> Homo sapiens

<400> 34
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 tagaatctta gttcatagg tcatccatta gctgtatcca aaggcaacta caatcccatg 120
 agactccctg cagacctacg tgggtgttgt agaagatctt tggttattta taccactgag 180
 tatttgagac tgattgtcac atcactataa cctacttaca ctgtttgaaa cagacattgt 240
 caattcaaaa caacaatag aaaaccaaac aaaaaacaga tcagggaag aataaacaac 300
 aacaaagaga agatgatttg ctggtcaaaa cggtgtgtga atagagattt tccactgaat 360
 atgagacaca tgaataagaa atgaagggtg gggagatagc aatgaaaata tttggggaaa 420
 gacagtccag actgaggaaa tagcctatg 449

<210> 35
 <211> 579
 <212> DNA
 <213> Homo sapiens

<400> 35
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 gcagggcagt gactgaagca caggaagcag tgacactcat cagccatcat caaatggaat 180
 aacataagcg gctgatcgaa actagctgga aggaaattgc agtcataata tctgtaagca 240
 tgttggtttt tttttttaat gttctgccct ttacacctat cattttatga acatttctct 300
 ataccagggg ttggcaaaact ttttcggtaa aaggtaagat aataaatatt tcaagctttg 360
 tgggctatct ggtgtgtgtc ccgaatcctc aatcccgcga ttgcaatgaa aagcagccat 420
 aaatgagtga tcatggctgt gttccaataa aactttatct aagaaacaag tggcaggctg 480
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579

<210> 36
 <211> 683
 <212> DNA
 <213> Homo sapiens

<400> 36
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 ctttgccttg taaatcagag aattcttcca gatcttgtgg aagaccatca aggcagtact 240
 tccatgagtc tgcaagaaac cacagcatta gtgggcttag ggtgccccct aaagcagata 300
 caacttagat cataacaccc aagtcctttt gaatatctga aaagccttcc caagaagaat 360
 gggaacaaac aagcccagac tataaagact acaataaata cctaattatt caatgcctgg 420
 gcacagacag acatttacia gtatcaagat catccaggaa aacatgacct caccaaata 480
 actaaataag gcaacagaga tcaatcctgg agaaacagag atatgtggcc tttcagacag 540
 agaattcaaa attcagacag agaatttgaa gagtatcttt gccagatata ctactctagg 600
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<210> 37
 <211> 643
 <212> DNA
 <213> Homo sapiens

<400> 37
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 caggaagaaga aaggggacaga ggggaaatct gtggattatg agtttaaaag aaataaactt 180
 caaaaattag caagtctaag ttacagtagc tagggattct ggtatgtggg aagcaatata 240
 ggcaatggaa agcaagatat tacttgcaag tagacacata atttctgcta acattctatt 300
 gacaaaacc aggtcacatg gccacatctg tccagctcca gctgaggcct gtgaatgtct 360
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 agtagataat ggtgaatact tattagtctc tgccactccc ttaaaaatgg aatacacaaa 480
 ctgcgactgt gatcttctac ttacactgta cagcttctct gaattattct ggaacttaaa 540
 tttgtgcttg tctttacttg ttattcagaa agtatctaga gcctctcttg attttcttta 600
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<210> 38
 <211> 385
 <212> DNA

<213> Homo sapiens

<400> 38

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tatgtagttt tccaaaatat tctattttta aatgcactga ctttattttt atatcataga	120
tacattttata tataaagtat ttcaagatga atttgagaca aattgaagta acaaagcttg	180
atttccattc tgcatacaat attctctata attacaatgt aggttttggc cacttgtttt	240
gactaacata gctatgccat cttttaaata tctgtatgcc ttgttttct gtaaattaaa	300
attcagacat acaaagaaat ataaggagag ttaggagAAC agtgataaaa gataaaatgg	360
caccacagta attcctaaat aaggg	385

<210> 39

<211> 655

<212> DNA

<213> Homo sapiens

<400> 39

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aagagaaagc tctgttttgt cttccagttc tatctgccgg aattccaaag agtgctccac	180
ttcgttatat aatgctgcta cataggtctc agaaatcttt tggttttgaa gagggaaaaa	240
tttgaaatta aatatagata aaactgaacc atattcagat caatatgatc ttagaaccta	300
tagatttttg cctgtattat ctacactgag actgaatagc atacatattt tgttcagtgg	360
gtattaatgg ttccatgatt ctaattttgc tcatttttct ggcatgtatt ggctacctgc	420
cctacttttg cagttgacca attttgctta taaagaccag gctgtaatgt ggccttggtc	480
ccatcatacc atacctaacc ccgctgtatc tgatattagg ttccctaaata aataaaaaata	540
aaactttact atttactcac taactctaaa aatgccttct cttctagttt actataccca	600
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<210> 40

<211> 663

<212> DNA

<213> Homo sapiens

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gaatatatga acaacctgag ccaatcatcc catcctgagg agaggtccaa aagacatccc	300
ctgagggttat gtgcaattgt gggctacagc tgtaagaaca taagaagcac tagccagtcc	360
ccaagagatg gagagaagcc cagtgaagct gtttatgccc aaagagagtg attttgagtt	420

ctaaatttcc aactctagtc cttatgtggc caagctctta ttgctgacct gtggatatgt 480
gagagattgc ctgcagtgtc tgtgttttta ttgcaataa atttcttaag catgctagag 540
taggttcagt tccttgttac caactgctct ctcaccaagg cagactcttg gggagtgata 600
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gtg 663

<210> 41
<211> 551
<212> DNA
<213> Homo sapiens

<400> 41
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catttggggg gtgctgacac accagcccc tgccacctca gccctctctg gactttgggc 480
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cccctcagca t 551

<210> 42
<211> 625
<212> DNA
<213> Homo sapiens

<400> 42
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agcacctgcc cgggcccgct gcgca 625

<210> 43
 <211> 465
 <212> DNA
 <213> Homo sapiens

<400> 43
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 ataaatatta tgcttcattt atagttgttt acttcccttt tgaggaaaac aacatgagtt 180
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 tattggggaa gtgggattat catgagagta caatccggta taaaagcgag cttggccctt 360
 tctggctctc ttatatgagg gctctcttgc tcttctgcct tccaccatgg gtagatgcag 420
 caagaagacc ctcaccacat atggggcccct cactcttatg ctccc 465

<210> 44
 <211> 546
 <212> DNA
 <213> Homo sapiens

<400> 44
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 agagcaaagg caaactagtg atgggtgccat gaaagcctgt ctattaagac cactactact 180
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 atggta 546

<210> 45
 <211> 688
 <212> DNA
 <213> Homo sapiens

<400> 45
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cgagagggtc agatggagac cttgcatcct gcccgagaag tgccccaccc cctccaatat	420
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gctatggaac caaataaccc agaaattaaa agcttcaactg tagctgtcct tttccccatt	540
tcctaaatgg aatttaaaaa gctctggctt gtcaaaagg gaagattatt ttctgaattg	600
gaagtctgta gatataattga gcaacagcca ccctctctgg gtccctgcaa atggtagcca	660
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<210> 46
 <211> 663
 <212> DNA
 <213> Homo sapiens

<400> 46	
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cccaaatgga tgaacacgta ttgcagaaga gacagtccgc agctaagtgt gacatcctta	180
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cagggtgatt tattctatca tctctccctg gaataaatcc tatgatggag agggaaaact	360
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<210> 47
 <211> 703
 <212> DNA
 <213> Homo sapiens

<400> 47	
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agagtagagg caaggacctg gaaggaagcc acttacagca gatgcagagg tcccactagg	180
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aatggtgata ctgtgctcta agactgaaaa tcagaaagaa gaataaattt aggggagtgg	360
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 tccatttcac agatgaggaa gtggaggctc tgaaatgtta cataacctgc ccagggtcac 660
 aggtatctga ctctggccat tatgtctctt ctactgtgcc cta 703

<210> 48
 <211> 682
 <212> DNA
 <213> Homo sapiens

<400> 48
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 gactgctgtg ctggcagcaa gaatttcaag ccagtggatc ttagcttgct tggctccatt 180
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 <213> Homo sapiens

<400> 49
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<210> 51
 <211> 638
 <212> DNA
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 <211> 707
 <212> DNA
 <213> Homo sapiens

<400> 52
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 ggggcagagt atttccaaa tgccttatac acttactttc agcactaaat gtatttgtgc 180
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tcattagagt	gagtaaaact	cacactggta	tcttgctatt	gtttaaggag	aacaatggat	300
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tatcctatac	aataaagcag	tattaattgc	tgccttccct	ggagtctcta	aagatactcg	420
gtaagtgtac	agtaccctga	tgaactaaag	ccaaaagtta	gggctgattt	cgggcttcat	480
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agaagactcc	accgcctttc	aaggcaataa	attcttgcct	cttctccaaa	tactctaact	600
gaaacttctg	ctgttgcaat	ataattcaat	gtgttttttt	ccagacttca	atgaaagcaa	660
gaattctcat	tctgcatgta	attatatccc	ttataatacc	cacagcc		707

<210> 53
 <211> 654
 <212> DNA
 <213> Homo sapiens

<400> 53		
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<210> 54
 <211> 775
 <212> DNA
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<400> 54		
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<211> 224
<212> DNA
<213> Homo sapiens

<400> 55
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<210> 56
<211> 465
<212> DNA
<213> Homo sapiens

<400> 56
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<210> 57
<211> 621
<212> DNA
<213> Homo sapiens

<400> 57
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<210> 58
<211> 24
<212> PRT
<213> Homo sapiens

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<400> 58
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Trp Asn Leu Glu Asp Asn Gly Gly Ile Asn Ala Phe Lys Ile Pro Ser
1          5          10          15

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```

Glu Asn Tyr Phe Gln Pro Arg Ile
20

```

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<210> 59
<211> 27
<212> PRT
<213> Homo sapiens

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<400> 59
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```

Pro Ala Thr Ser Ser Ser Gln Leu Ile Ser Ile Glu Thr Glu Leu Ser
1          5          10          15

```

```

Leu Ala Gln Cys Ile Ser Val Val Ser Ala Glu
20          25

```

```

<210> 60
<211> 63
<212> PRT
<213> Homo sapiens

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```
<400> 60
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```

Thr Cys Ile Phe Leu Pro Val Leu Lys Leu Asn His Leu Phe Val Leu
1          5          10          15

```

```

Ile Phe Val Ser Leu Ser Pro Cys Pro Gln Pro Val Ala Thr Thr Ile
20          25          30

```

```

Leu Leu Ser Val Ser Met Asn Leu Thr Thr Leu His Thr Ser Tyr Lys
35          40          45

```

```

Trp Arg His Thr Val Phe Tyr Gly Phe Leu Glu Ala Gly Ile Phe
50          55          60

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```

<210> 61
<211> 64
<212> PRT
<213> Homo sapiens

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<400> 61
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```

Thr Ile Gly Gly Thr Leu Leu Gly Leu Ser Phe Leu Ile Cys Lys Ala
1          5          10          15

```

Leu Val Ile Leu Glu Ser Ser Ser His Phe Phe Val Asp Arg Arg Arg
20 25 30

Gly Ser Gly Lys Lys Ala Tyr Ala Asn Lys Gln Pro Gln Gly Lys Pro
35 40 45

Ala Ala Gly Ala Leu Pro Ser Trp Leu Arg Lys Leu Pro Leu Gly Arg
50 55 60

<210> 62

<211> 50

<212> PRT

<213> Homo sapiens

<400> 62

Trp Lys Asn Trp Leu Phe Phe Thr Cys Leu His Cys Thr Thr Pro His
1 5 10 15

Asp Val Met Phe His Ile Leu Leu Lys Ile Pro Glu Phe His Glu Val
20 25 30

Leu Gly Thr Cys His Ile Leu Gln Gly Leu Asn Lys Ile Val Phe Thr
35 40 45

Leu Pro
50

<210> 63

<211> 36

<212> PRT

<213> Homo sapiens

<400> 63

Thr Trp Thr Pro Asp Gly Glu Ser Val Leu Arg Asp Pro Glu Gly Trp
1 5 10 15

Glu His Trp Thr Pro Asp Gly Glu Ser Val Leu Arg Asp Pro Glu Gly
20 25 30

Trp Glu His Trp
35

<210> 64

<211> 45

<212> PRT

<213> Homo sapiens

<400> 64

Arg Gln Glu Ala Leu Leu His His Val Ala Thr Ile Ala Asn Thr Phe
1 5 10 15

Arg Ser His Arg Ala Ala Gln Arg Cys His Glu Asp Trp Lys Arg Leu
20 25 30

Ala Arg Val Met Asp Arg Phe Phe Leu Ala Ile Phe Phe
35 40 45

<210> 65

<211> 24

<212> PRT

<213> Homo sapiens

<400> 65

His Cys Gln Leu Ser Pro Leu Pro Pro Gly Ile Phe Ser Ile Ser Cys
 1 5 10 15

Trp Leu Ser Lys Arg Trp Arg Pro
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<210> 66
 <211> 36
 <212> PRT
 <213> Homo sapiens

<400> 66

Gln Ser Trp Leu Asp Thr Arg Leu Ala Trp Asn Thr Ser Ala His Pro
 1 5 10 15

Arg His Ala Ile Thr Leu Pro Trp Glu Ser Leu Trp Thr Pro Arg Leu
 20 25 30

Thr Ile Leu Glu
 35

<210> 67
 <211> 24
 <212> PRT
 <213> Homo sapiens

<400> 67

Trp Asn Leu Glu Asp Asn Gly Gly Ile Asn Ala Phe Lys Ile Pro Ser
 1 5 10 15

Glu Asn Tyr Phe Gln Pro Arg Ile
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<210> 68
 <211> 38
 <212> PRT
 <213> Homo sapiens

<400> 68

Cys Leu Ser Leu Met Val Gly Ser Leu Leu Glu Thr Ile Phe Ile Thr
 1 5 10 15

His Leu Leu His Val Ala Thr Thr Gln Pro Pro Pro Leu Pro Arg Trp
 20 25 30

Leu His Ser Leu Leu Leu
 35

<210> 69
 <211> 89
 <212> PRT
 <213> Homo sapiens

<400> 69

Gly Glu Thr Asp Val Ile Tyr Leu Leu Ile Ile Cys Arg Lys Ile Thr
 1 5 10 15

Asn Ile Met Val Pro Cys Val Leu Ile Ser Gly Leu Val Leu Leu Ala
 20 25 30

Tyr Phe Leu Pro Ala Gln Ser Leu Gly Thr Ala Ala Pro Glu Ile Arg
 35 40 45

Cys Cys Gly Asp Ala Val Asn Phe Val Ala Lys Asn Met Arg Gly Gln
 50 55 60

Asp Thr Arg Gly Gln Asp Asp Gly Ile Cys Phe Trp Val Ala Arg Val
 65 70 75 80

Leu Phe Ser Leu Gly Ser Asn Leu Ile
 85

<210> 70
 <211> 29
 <212> PRT
 <213> Homo sapiens

<400> 70

Asp Ser Thr Lys Ala Arg Pro Gln Lys Tyr Glu Gln Leu Leu His Ile
 1 5 10 15

Glu Asp Asn Asp Phe Ala Met Arg Pro Gly Phe Gly Gly
 20 25

<210> 71
 <211> 40
 <212> PRT
 <213> Homo sapiens

<400> 71

Pro Asp Phe Arg Thr Asp Ser Phe Ser Val Arg Pro Thr Gln Ile Pro
 1 5 10 15

Val Gly Asn Leu Pro Phe Pro Cys Ala Thr Glu Cys Lys Glu Asn Ser
 20 25 30

Pro Lys Thr Ser Leu Thr Thr Leu
 35 40

<210> 72
 <211> 50
 <212> PRT
 <213> Homo sapiens

<400> 72

Gly Asp Cys Arg Met Ala His Ala Glu Gln Lys Leu Met Asp Asp Leu
 1 5 10 15

Leu Asn Lys Thr Cys Tyr Asn Asn Leu Ile Arg Pro Ala Thr Ser Ser
 20 25 30

Ser Gln Leu Ile Ser Ile Gln Thr Ala Leu Ser Leu Ala Gln Cys Ile
 35 40 45

Ser Val
 50

<210> 73
 <211> 43
 <212> PRT
 <213> Homo sapiens

<400> 73

Ala Glu Gln Lys Leu Met Asp Asp Leu Leu Asn Lys Thr Arg Tyr His
 1 5 10 15

Asn Leu Ile Arg Pro Ala Ala Ser Ser Ser Gln Leu Ile Ser Ile Glu
 20 25 30

Met Glu Leu Ser Leu Ala Gln Cys Ile Ser Val
 35 40

<210> 74
 <211> 51
 <212> PRT
 <213> Homo sapiens

<400> 74

Arg Gly Thr Ala Ala Trp Pro Met Pro Ser Arg Lys Leu Met Asp Asp
 1 5 10 15

Leu Leu Asn Lys Thr Cys Tyr Asn Asn Leu Ile Arg Pro Ala Thr Ser
 20 25 30

Ser Ser Gln Leu Ile Ser Ile Gln Thr Ala Leu Ser Leu Ala Gln Cys
 35 40 45

Ile Ser Val
 50

<210> 75
 <211> 45
 <212> PRT
 <213> Homo sapiens

<400> 75

Gly Lys Phe Thr Cys Ile Glu Val Lys Phe His Leu Glu Arg Gln Met
 1 5 10 15

Gly Tyr Tyr Leu Ile Gln Met Tyr Ile Pro Ser Leu Leu Ile Val Ile
 20 25 30

Leu Ser Trp Val Ser Leu Trp Ile Asn Met Asp Ala Ala
 35 40 45

<210> 76
 <211> 50
 <212> PRT
 <213> Homo sapiens

<400> 76

Val Ser Tyr Val Lys Ala Ile Asp Ile Trp Met Ala Val Cys Leu Leu
 1 5 10 15

Phe Val Phe Ala Ala Leu Leu Glu Tyr Ala Ala Ile Asn Phe Val Ser
 20 25 30

Arg Gln His Lys Glu Phe Ile Arg Leu Arg Arg Arg Gln Arg Arg Gln
 35 40 45

Arg Leu
 50

<210> 77
 <211> 28
 <212> PRT
 <213> Homo sapiens

<400> 77

Arg Leu Thr Leu Ile Leu Ser Cys Leu Met Asp Leu Lys Asn Phe Pro
1 5 10 15

Met Asp Ile Gln Thr Cys Thr Met Gln Leu Glu Ser
20 25

<210> 78
<211> 72
<212> PRT
<213> Homo sapiens

<400> 78

Ile Ser Leu Ser Ala Val Phe Leu Arg Gly Ser Leu Leu Lys Leu Trp
1 5 10 15

Leu Phe Ser Thr Gly Trp Tyr Asn Arg Leu Phe Ile Asn Phe Val Leu
20 25 30

Arg Arg His Val Phe Phe Phe Val Leu Gln Thr Tyr Phe Pro Ala Ile
35 40 45

Leu Met Val Met Leu Ser Trp Val Ser Phe Trp Ile Asp Arg Arg Ala
50 55 60

Val Pro Ala Arg Val Ser Leu Gly
65 70

<210> 79
<211> 159
<212> PRT
<213> Homo sapiens

<400> 79

Arg Cys Arg Pro Ser Pro Tyr Val Val Asn Phe Leu Val Pro Ser Gly
1 5 10 15

Ile Leu Ile Ala Ile Asp Ala Leu Ser Phe Tyr Leu Pro Leu Glu Ser
20 25 30

Gly Asn Cys Ala Pro Phe Lys Met Thr Val Leu Leu Gly Tyr Ser Val
35 40 45

Phe Leu Leu Met Met Asn Asp Leu Leu Pro Ala Thr Ser Thr Ser Ser
50 55 60

His Ala Ser Leu Val Arg Pro His Pro Ser Arg Asp Gln Lys Arg Gly
65 70 75 80

Val Cys Trp Met Gly Arg Gly Met Gly Arg Thr Arg Arg Ser Glu Lys
85 90 95

Gly Ser Trp Lys Lys Ile Leu Trp Glu Arg Asn Lys Lys Phe Val Ala
100 105 110

Pro Leu Ala Leu Met Gln Thr Pro Leu Pro Ala Gly Val Tyr Phe Ala
115 120 125

Leu Cys Leu Ser Leu Met Val Gly Ser Leu Leu Glu Thr Ile Phe Ile
130 135 140

Thr His Leu Leu Ala Arg Gly His His Pro Ala Pro Thr Ser Ala
145 150 155

<210> 80

<211> 60
 <212> PRT
 <213> Homo sapiens

<400> 80

Leu Ser Ser Ser Met Asp Val Asp Lys Thr Pro Lys Gly Leu Thr Ala
 1 5 10 15

Tyr Val Ser Asn Glu Gly Arg Ile Arg Tyr Lys Lys Pro Met Lys Gly
 20 25 30

Asp Ser Ile Cys Asn Leu Asp Ile Phe Tyr Phe Pro Phe Asp Gln Gln
 35 40 45

Asn Cys Thr Leu Thr Phe Ser Ser Phe Leu Tyr Thr
 50 55 60

<210> 81
 <211> 33
 <212> PRT
 <213> Homo sapiens

<400> 81

Gln Glu Trp Ser Asp Tyr Lys Leu Arg Trp Asn Pro Thr Asp Phe Gly
 1 5 10 15

Asn Ile Thr Ser Leu Lys Val Pro Ser Glu Met Ile Trp Ile Pro Asp
 20 25 30

Ile

<210> 82
 <211> 58
 <212> PRT
 <213> Homo sapiens

<400> 82

Cys Pro Gly Val Ile Arg Arg His His Gly Gly Ala Thr Asp Gly Pro
 1 5 10 15

Arg Glu Thr Asp Val Ile Tyr Ser Leu Ile Ile Leu Arg Lys Pro Leu
 20 25 30

Phe Tyr Val Ile Asn Ile Ile Val Pro Cys Val Leu Ile Trp Gly Leu
 35 40 45

Val Leu Leu Ala Tyr Phe Leu Pro Ala Gln
 50 55

<210> 83
 <211> 43
 <212> PRT
 <213> Homo sapiens

<400> 83

Arg Phe Leu Ile Phe Val Met Val Val Ala Thr Leu Ile Val Met Asn
 1 5 10 15

Cys Val Ile Val Leu Asn Val Ser Gln Arg Thr Pro Thr Thr His Ala
 20 25 30

Met Ser Pro Arg Leu Arg His Val Ser Ala Glu

35

40

<210> 84
 <211> 92
 <212> PRT
 <213> Homo sapiens

<400> 84

His Pro Asp Ser Lys Tyr His Leu Lys Lys Arg Ile Thr Ser Leu Ser
 1 5 10 15

Leu Pro Ile Val Ser Ser Ser Glu Ala Asn Lys Val Leu Thr Arg Ala
 20 25 30

Pro Ile Leu Gln Ser Thr Pro Val Thr Pro Pro Pro Leu Ser Pro Ala
 35 40 45

Phe Gly Gly Thr Ser Lys Ile Asp Gln Tyr Ser Arg Ile Leu Phe Pro
 50 55 60

Val Ala Phe Ala Gly Phe Asn Leu Val Tyr Trp Gly Ser Phe Ile Phe
 65 70 75 80

Pro Lys Ile Gln Trp Glu Val Ser Thr Ser Val Glu
 85 90

<210> 85
 <211> 61
 <212> PRT
 <213> Homo sapiens

<400> 85

Arg Ser Val Gly Val Glu Thr Gly Glu Thr Lys Lys Glu Gly Ala Ala
 1 5 10 15

Arg Ser Gly Gly Gln Gly Gly Ile Arg Ala Arg Leu Arg Pro Met Asp
 20 25 30

Ala Asp Thr Ile Asp Ile Asn Ala Arg Ala Val Phe Pro Ala Ala Phe
 35 40 45

Ala Ala Val Asn Val Ile Tyr Trp Ala Ala Tyr Ala Met
 50 55 60

<210> 86
 <211> 132
 <212> PRT
 <213> Homo sapiens

<400> 86

Asn Cys Cys Glu Glu Ile Tyr Thr Asp Ile Thr Tyr Ser Phe Tyr Ile
 1 5 10 15

Ile Arg Leu Pro Met Phe Tyr Thr Ile Asn Leu Ile Ile Pro Cys Leu
 20 25 30

Phe Ile Ser Phe Leu Thr Val Leu Val Phe Tyr Leu Pro Ser Asp Cys
 35 40 45

Gly Glu Lys Val Thr Leu Cys Ile Ser Val Leu Leu Ser Leu Thr Val
 50 55 60

Phe Leu Leu Val Ile Thr Thr Ile Pro Ser Thr Ser Leu Val Gly Pro
 65 70 75 80

Leu Val Gly Glu Tyr Leu Leu Phe Thr Met Ile Phe Gly Thr Leu Ala
85 90 95

Ile Val Val Thr Val Phe Glu Leu Asn Ile His Tyr Arg Thr Pro Thr
100 105 110

Thr His Thr Met Pro Arg Trp Val Lys Thr Val Phe Leu Lys Leu Leu
115 120 125

Pro Gln Val Leu
130

<210> 87
<211> 70
<212> PRT
<213> Homo sapiens

<400> 87

Ser Pro Thr His Asp Glu His Leu Leu His Gly Gly Gln Pro Pro Glu
1 5 10 15

Gly Asp Pro Asp Leu Ala Lys Ile Leu Glu Glu Val Arg Tyr Ile Ala
20 25 30

Asn Arg Phe Arg Cys Gln Asp Glu Ser Glu Ala Val Cys Asn Glu Trp
35 40 45

Lys Phe Pro Ala Cys Val Val Asp Arg Leu Cys Leu Met Ala Phe Ser
50 55 60

Val Phe Thr Ile Ile Cys
65 70

<210> 88
<211> 42
<212> PRT
<213> Homo sapiens

<400> 88

Glu Ile Thr Asp Thr Ser Arg Lys Val Ile Gln Thr Gln Gly Glu Trp
1 5 10 15

Glu Leu Leu Gly Ile Asn Lys Ala Thr Pro Lys Met Ser Met Gly Asn
20 25 30

Asn Leu Tyr Asp Gln Ile Met Phe Tyr Val
35 40

<210> 89
<211> 38
<212> PRT
<213> Homo sapiens

<400> 89

Asp Leu Ser Cys Leu Leu Ile Cys Ser Ile Ile Ala Cys Leu Tyr Asn
1 5 10 15

Ile Asn Ile Ile Leu Pro Cys Leu Leu Arg Ser Leu Met Lys Val Ile
20 25 30

Leu Phe Ile Leu Ala Ser
35

<210> 90
 <211> 60
 <212> PRT
 <213> Homo sapiens

<400> 90

Phe Phe Ile Leu Leu Glu Asp Phe Ser Val Ser Ser Glu His Gly Leu
 1 5 10 15
 Ile Leu Gly Lys His Ser Ser Arg Ser Phe Met Pro Arg Phe Cys Ser
 20 25 30
 Phe Ile Cys Arg Leu Leu Pro Pro Cys His Phe Leu Pro Pro Pro Asn
 35 40 45
 Cys Glu Thr Ala Phe Ser Phe Leu Lys His Leu Trp
 50 55 60

<210> 91
 <211> 37
 <212> PRT
 <213> Homo sapiens

<400> 91

Gly Tyr Phe Leu Ser Leu Asp Cys Leu Ser Pro Asn Ile Phe Ile Ala
 1 5 10 15
 Ile Ser Leu Thr Phe Ile Ser Tyr Ser Cys Val Ser Tyr Ser Val Glu
 20 25 30
 Asn Leu Tyr Ser Pro
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<210> 92
 <211> 30
 <212> PRT
 <213> Homo sapiens

<400> 92

Phe Leu Asp Lys Val Leu Leu Glu His Ser His Asp His Ser Phe Met
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 Ala Ala Phe His Cys Asn Gly Gly Ile Glu Asp Ser Gly His
 20 25 30

<210> 93
 <211> 29
 <212> PRT
 <213> Homo sapiens

<400> 93

Ser Pro Gly Leu Ile Ser Val Ala Leu Phe Ser Ser Phe Gly Glu Val
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 Met Phe Ser Trp Met Ile Leu Ile Leu Val Asn Val Cys
 20 25

<210> 94
 <211> 31
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 <213> Homo sapiens

<400> 94

Leu Ser Lys Glu Glu Thr Val Asp Asn Gly Glu Tyr Leu Leu Val Ser
1 5 10 15

Ala Thr Pro Leu Lys Met Glu Tyr Thr Asn Ser His Cys Asp Phe
20 25 30

<210> 95
<211> 18
<212> PRT
<213> Homo sapiens

<400> 95

Trp Cys His Phe Ile Phe Tyr His Cys Ser Pro Asn Ser Pro Tyr Ile
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Ser Leu

<210> 96
<211> 44
<212> PRT
<213> Homo sapiens

<400> 96

Ile Phe Asn Phe Lys Phe Phe Pro Leu Gln Asn Gln Lys Ile Ser Glu
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Thr Tyr Val Ala Ala Leu Tyr Asn Glu Val Glu His Ser Leu Glu Phe
20 25 30

Arg Gln Ile Glu Leu Glu Asp Lys Thr Glu Leu Ser
35 40

<210> 97
<211> 43
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<213> Homo sapiens

<400> 97

Phe Leu Cys Ser Tyr Ser Cys Ser Pro Gln Leu His Ile Thr Ser Gly
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Asp Val Phe Trp Thr Ser Pro Gln Asp Gly Met Ile Gly Ser Gly Cys
20 25 30

Ser Tyr Ile Pro Phe Ser Trp Val Arg Cys Ser
35 40

<210> 98
<211> 93
<212> PRT
<213> Homo sapiens

<400> 98

Gly His Ser Cys Ser Cys Pro Thr Val Ala Pro Asp Leu Gly Ile Ser
1 5 10 15

Ala Leu Leu Gly Ala Gln Glu Val Pro Cys Pro His Trp Leu Arg Ile
20 25 30

Gly Cys Ser Cys Pro Trp Ala Val Pro Ala Pro Val Gln Ser Glu Val
35 40 45

Val Ala Lys Pro Arg Cys Tyr His Ser Leu Ala Arg Cys Ala Phe Ile
 50 55 60

Trp Gly Val Leu Thr His Gln Pro Pro Ala Thr Ser Ala Leu Ser Gly
 65 70 75 80

Leu Trp Ala Thr Thr Ser Met Arg Gly Arg Pro Gly Gly
 85 90

<210> 99
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<400> 99

Tyr Leu Arg Leu Ala Gln Ser Pro Arg Glu Ser Ser Glu Leu Glu Leu
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Glu Gly Ser Thr Trp Glu Arg Thr Arg Arg Gln Arg Ser Gly Ala Glu
 20 25 30

Ala Trp Glu Gln Thr His Gly Pro Arg His Pro Arg Ala Pro Pro Leu
 35 40 45

Tyr Pro Ala Arg Pro Ser Ser Leu Ala Pro Gly Cys Thr Ala Pro Ala
 50 55 60

Arg Ala Arg
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Pro Ala Val Phe His Lys Tyr Tyr Ala Ser Phe Ile Val Val Tyr Phe
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Pro Phe Glu Glu Asn Asn Met Ser Phe Ala Ser Pro Pro Lys Thr His
 20 25 30

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<400> 101

Cys Thr Trp Ile Glu Pro Ser Ser Asp Met Pro Gln Phe Thr Leu Leu
 1 5 10 15

Asn Thr Ser Trp
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<210> 102
 <211> 43
 <212> PRT
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<400> 102

Pro Gly Lys Ala Gln Arg Ser Asp Gly Asp Leu Ala Ser Cys Pro Arg
 1 5 10 15

Ser Ala Pro Pro Pro Pro Ile Ser Gly Phe Ser Leu His Thr Asn Gln
 20 25 30

Ala Glu Asn Ser Pro Leu Pro Thr Thr Pro His
 35 40

<210> 103
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 <212> PRT
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<400> 103

Pro Pro Tyr Gln Val Leu Tyr Pro Gly Leu Phe Arg Phe Phe Ser Pro
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 20 25 30

Ser Leu Gly Ala Pro Gln Glu Leu Gln Asn Tyr Ser Ser Leu Thr Pro
 35 40 45

Tyr Ser Gln Leu Tyr Met Thr Thr Asn Asp His Ser Leu Lys Gln Asn
 50 55 60

Arg Gln
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<210> 104
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 <213> Homo sapiens

<400> 104

Pro Glu Gln Glu Asn Phe Thr His Ser Gly Asp Trp Glu Arg Val Glu
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Ala Arg Thr Trp Lys Glu Ala Thr Tyr Ser Arg Cys
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<400> 105

Ser Ala Phe Pro Thr Glu Val Thr Ser Ser Ser His Trp Asp Trp Leu
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Asp Thr Gly Cys Ser Pro Gln Arg Ala Ser Gly Ser Arg Val Glu Cys
 20 25 30

His Val Pro Trp Glu Gly Gln Gly Val Arg Glu Leu Pro Pro Leu Ala
 35 40 45

Lys Arg Ser Pro Glu Gly Leu Cys His Glu Glu Gln Cys Ile Pro Ala
 50 55 60

Gln Ile Leu Pro Phe Ser His Gly Leu His Asn Pro Gln Thr Ser Arg
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Phe Pro Gln Val Pro Thr Pro Pro Gly Thr
 85 90

<210> 106
 <211> 37
 <212> PRT
 <213> Homo sapiens

<400> 106

Trp His Leu Ile Asn Tyr Ser Val Cys Ile Tyr Leu Ile Phe Ser Lys
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His Leu Lys Ile Leu Leu Phe Thr Leu Tyr Pro Ile Leu Asn Lys Val
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Ile Gln Asn Pro Cys
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<210> 107
 <211> 34
 <212> PRT
 <213> Homo sapiens

<400> 107

Arg Lys Ala Pro Ala Arg Val Leu Val Pro Thr Thr Lys Pro Met Gln
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Arg Ala Pro His Ala Arg Gly Trp Leu Thr Pro Leu Pro Ala Ala Ala
 20 25 30

His Arg

<210> 108
 <211> 68
 <212> PRT
 <213> Homo sapiens

<400> 108

Phe Val Ile Glu Leu Glu His Pro Glu Gly Arg Met Thr Pro Ile Trp
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Ser Lys Gly Leu Gln His Asp His Pro Gln Trp Gln Met Cys Leu Pro
 20 25 30

Gly Asn His Ala His Pro Thr Pro His Cys Phe Ser Ala His Thr Ala
 35 40 45

Pro Ile Cys Ser Asp Ser Gln Trp Arg Asp His Leu Leu Pro Arg Gly
 50 55 60

Met Asn His Cys
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<210> 109
 <211> 36
 <212> PRT
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<400> 109

Leu Leu Phe Lys Glu Asn Asn Gly Trp Val Asp Glu Arg Glu Cys Gln
 1 5 10 15

Leu Asp Gln Gln Thr Ala Val Pro Thr Glu Val Leu Leu Ser Tyr Thr
 20 25 30

Ile Lys Gln Tyr
35

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<400> 110

Trp Asn Trp Phe Pro Val Gln Gly Glu Phe Leu Pro Cys Ile Leu Ser
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Cys Pro Asp Lys Leu Trp Leu Pro Ser Ile Leu Asn Trp Asn Asn Trp
20 25 30

Val Asn Asn Tyr Leu Thr Cys Phe Tyr
35 40

<210> 111
<211> 53
<212> PRT
<213> Homo sapiens

<400> 111

Ile Gln Arg Leu His Glu Val Asp Gln Val Asn Ile Pro Leu Trp Leu
1 5 10 15

Tyr Gln Asn Gly Gly Val Trp His Ile Arg His Leu Lys Ala Ala Gly
20 25 30

Pro Cys Val Asp Leu Gly Leu Tyr Ala Val Ser Asn Ala Val Cys Ile
35 40 45

Phe Glu Ser Phe Thr
50

<210> 112
<211> 35
<212> PRT
<213> Homo sapiens

<400> 112

Tyr Gln Phe Thr Leu Leu Ile Gly Leu Ser Val Phe Leu Ile Leu Tyr
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Thr Leu Ser Tyr Arg Leu Thr Ala Thr Cys Leu Gly Ile Pro Leu Met
20 25 30

Ser Ile Tyr
35

<210> 113
<211> 69
<212> PRT
<213> Homo sapiens

<400> 113

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Phe Val Leu Ala Asn Phe Ser Tyr Leu Glu Trp Leu Tyr Phe Pro Asn
20 25 30

Ala Cys Thr Pro Ile Val Ser Arg Lys Tyr Asn Arg Tyr Val Leu Leu
 35 40 45

Ile Val Lys Ala Tyr Arg Gln Lys Gly Leu Ala Leu Ser Gln Met Arg
 50 55 60

Leu Thr Gln Thr Val
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<210> 114
 <211> 60
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<400> 114

Cys Lys Ser Met Asp Pro Leu Ser Leu Ser Ala Phe Pro Cys Leu Ile
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Gln Ile His Ser Val Leu Gly Trp Val Cys Ser Asp Thr Cys Thr Ser
 35 40 45

Thr Gly Ala Ser Ala Gly Arg Ser Gly Leu Thr Glu
 50 55 60

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<210> 116
<211> 471
<212> PRT
<213> Homo sapiens
<400> 116

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Ser Met Ser Thr Thr Gly Arg Gly Val Thr Phe Thr Ile Asn Cys Ser
35        40        45
Gly Phe Gly Gln His Gly Ala Asp Pro Thr Ala Val Asn Ser Val Phe
50        55        60
Asn Arg Lys Pro Phe Arg Pro Val Thr Asn Ile Ser Val Pro Thr Gln
65        70        75        80
Val Asn Ile Ser Phe Ala Met Ser Ala Ile Leu Asp Val Asn Glu Gln
85        90        95
Leu His Leu Leu Ser Ser Phe Leu Trp Leu Glu Met Val Trp Asp Asn
100       105       110

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Pro Phe Ile Ser Trp Asn Pro Glu Glu Cys Glu Gly Ile Thr Lys Met
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Ser Met Ala Ala Lys Asn Leu Trp Leu Pro Asp Ile Phe Ile Ile Glu
130                               135                               140

Leu Met Asp Val Asp Lys Thr Pro Lys Gly Leu Thr Ala Tyr Val Ser
145                               150                               155                               160

Asn Glu Gly Arg Ile Arg Tyr Lys Lys Pro Met Lys Val Asp Ser Ile
165                               170                               175

Cys Asn Leu Asp Ile Phe Tyr Phe Pro Phe Asp Gln Gln Asn Cys Thr
180                               185                               190

Leu Thr Phe Ser Ser Phe Leu Tyr Thr Val Asp Ser Met Leu Leu Asp
195                               200                               205

Met Glu Lys Glu Val Trp Glu Ile Thr Asp Ala Ser Arg Asn Ile Leu
210                               215                               220

Gln Thr His Gly Glu Trp Glu Leu Leu Gly Leu Ser Lys Ala Thr Ala
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Lys Leu Ser Arg Gly Gly Asn Leu Tyr Asp Gln Ile Val Phe Tyr Val
245                               250                               255

Ala Ile Arg Arg Arg Pro Ser Leu Tyr Val Ile Asn Leu Leu Val Pro
260                               265                               270

Ser Gly Phe Leu Val Ala Ile Asp Ala Leu Ser Phe Tyr Leu Pro Val
275                               280                               285

Lys Ser Gly Asn Arg Val Pro Phe Lys Ile Thr Leu Leu Leu Gly Tyr
290                               295                               300

Asn Val Phe Leu Leu Met Met Ser Asp Leu Leu Pro Thr Ser Gly Thr
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Pro Leu Ile Gly Val Tyr Phe Ala Leu Cys Leu Ser Leu Met Val Gly
325                               330                               335

Ser Leu Leu Glu Thr Ile Phe Ile Thr His Leu Leu His Val Ala Thr
340                               345                               350

Thr Gln Pro Pro Pro Leu Pro Arg Trp Leu His Ser Leu Leu Leu His
355                               360                               365

Cys Asn Ser Pro Gly Arg Cys Cys Pro Thr Ala Pro Gln Lys Glu Asn
370                               375                               380

Lys Gly Pro Gly Leu Thr Pro Thr His Leu Pro Gly Val Lys Glu Pro
385                               390                               395                               400

Glu Val Ser Ala Gly Gln Met Pro Gly Pro Ala Glu Ala Glu Leu Thr
405                               410                               415

Gly Gly Ser Glu Trp Thr Arg Ala Gln Arg Glu His Glu Ala Gln Lys
420                               425                               430

Gln His Ser Val Glu Leu Trp Leu Gln Phe Ser His Ala Met Asp Ala
435                               440                               445

Met Leu Phe Arg Leu Tyr Leu Leu Phe Met Ala Ser Ser Ile Ile Thr
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Val Ile Cys Leu Trp Asn Thr
465 470

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<211> 1465
<212> DNA
<213> Homo sapiens

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 Asn Thr Ile Ser Gln Cys Gly Trp Ser Ala Ser Ala Asn Trp Thr Pro
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 Ser Ile Ser Pro Ser Met Asp Arg Gly Glu Arg Ser Pro Ser Ala Leu
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 Ser Pro Thr Gln Val Thr Arg Ala Trp Arg Arg Met Ser Arg Ser Phe
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 Ile Asp Ala Leu Ser Phe Tyr Leu Pro Leu Glu Ser Gly Asn Cys Ala
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 Pro Phe Lys Met Thr Val Leu Leu Gly Tyr Ser Val Phe Leu Leu Met
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 Met Asn Asp Leu Leu Pro Ala Thr Ser Thr Ser Ser His Ala Ser Leu
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 Val Arg Val Tyr Phe Ala Leu Cys Leu Ser Leu Met Val Gly Ser Leu
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 Leu Glu Thr Ile Phe Ile Thr His Leu Leu His Val Ala Thr Thr Gln
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 Pro Leu Pro Leu Pro Arg Trp Leu His Ser Leu Leu Leu His Cys Thr
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 Gly Gln Gly Arg Cys Cys Pro Thr Ala Pro Gln Lys Gly Asn Lys Gly
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 Pro Gly Leu Thr Pro Thr His Leu Pro Gly Val Lys Glu Pro Glu Val
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 Ser Ala Gly Gln Met Pro Gly Pro Gly Glu Ala Glu Leu Thr Gly Gly
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 Ser Glu Trp Thr Arg Ala Gln Arg Glu His Glu Ala Gln Lys Gln His
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 Ser Val Glu Leu Trp Val Gln Phe Ser His Ala Met Asp Ala Leu Leu
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